

## DESCRIPTION OF SERUM ALBUMIN LEVELS IN MENOPAUSE WOMEN IN THE WORKING AREA OF PUSKESMAS KOTA SELATAN

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### ABSTRACT

In menopause, the levels of estrone to estradiol drop drastically and estrone becomes the dominant estrogen. Data from WHO in 2014 states that by 2030 the number of women worldwide who enter menopause is estimated to reach 1.2 billion people. In Indonesia, it is estimated that by 2025 there will be 60 million menopausal women. In 2016, Indonesia reached 14 million menopausal women or 7.4% of the total population. Lack of these two hormones will cause symptoms at menopause, one of which is difficulty in collecting urine or incontinence. Menopause who have experienced these symptoms will result in a lack of albumin levels in the blood vessels or hypoalbuminemia.

This study aims to describe serum albumin levels in menopausal women. This research is a descriptive quantitative approach with a population of menopausal women in the Puskesmas area of South City 1920 with a sample of 95 menopausal women based on calculations using the Slovin formula / assumption. The sampling technique in this study using simple random sampling technique. The measuring instrument used in this study was the BTS-350 BioSystem spectrophotometer with the BCG examination method. The data obtained was carried out by a descriptive test by looking at the frequency of each variable.

The results of this study were an overview of serum albumin levels in menopausal women in the work area of the South City Health Center, namely normal albumin levels of 72.6%, low albumin levels 18.9%, and albumin levels high serum 8.4%.

**Keywords:** Menopause, albumin serum

### PRELIMINARY

Menopause is a very natural and normal event that occurs in a woman, but it causes many complaints and disturbances that are felt by women who experience menopause, usually only perceived as a process of "aging" or even thought of as a symptom of another disease[9].

The year 2018 states that in 2030 the number of women around the world who enter menopause is estimated to reach 1.2 billion people. In Indonesia, it is estimated that by 2025 there will be 60 million

menopausal women. In 2016, Indonesia reached 14 million menopausal women or 7.4% of the total population. According to 2013 World Health Statistics data, China's population is 1.35 billion, India 1.24 billion, the United States 313 million and Indonesia is fourth with 242 million[28].

Based on Susenas results in 2013, the number of elderly people in Indonesia has reached 20.04 million people or about 8.05% of the entire population of Indonesia. When compared according to gender, the number of elderly women is greater than that of men, namely 10.67

million people (8.61 percent of the total female population), more than men who are only 9.38 million people (7, 49% of the total male population) [2].

Based on data obtained from the Gorontalo Provincial Health Office (2018) the elderly are divided into two categories, namely pre-elderly and elderly. Pre-elderly from 2016 reached 136,933 people, in 2017 it reached 147,124, and in 2018 it reached 124,184 people. Meanwhile, the elderly in Gorontalo Province in 2016 reached 96,550 people, in 2017 it reached 92,569 people, and in 2018 it reached 123,637 people[6].

Then the data obtained from the Gorontalo City Health Office (2018) for women who have experienced menopause for the 45-59 year age group ranged as many as 17,978 people and those aged > 60 years were around 9,219 people. In 2019 menopausal women in the 45-59 age group ranged from 18,777 people and those aged > 60 years were 16,886 people. In Gorontalo City, there are 10 sub-districts including North City, Central City, East City, South City, West City, Pilolodaa, Duingingi, Sipatana, Dumbo Raya, and Hulonthalangi districts. Of the 10 sub-districts, Kota Selatan sub-district is in fourth place for the number of elderly women aged 45-59 years, with a total of 2,031 people. Meanwhile, based on data obtained from the Kota Selatan Puskesmas (2020), menopausal women in the Kota Selatan Puskesmas work area are 1.920 people aged 45-59 years[5].

In the menopause process, there are many changes experienced by menopausal women, one of which is the change in the human face. Scientifically it is known that the human face contains a lot of important information from an individual such as gender, race and age. Many changes that can occur in the human face, can be temporary or permanent. One example of such changes is wrinkles. Wrinkles are a natural process of aging. As you age, your

skin will become thinner, drier, and less elastic. Menopause is a natural event that occurs to every woman. Menopause is not a disease or only acquired if a woman has not had her menstrual cycle for at least 12 months.

Before menopause, estradiol and estrone were the main circulating estrogens in the body. These two hormones are produced mainly in the ovaries, with estradiol as the main hormone. Estrone is also produced through a change in one hormone, namely androstenedione, which is secreted by the adrenal glands. After menopause, the levels of estrone to estradiol drop drastically and estrone becomes the dominant estrogen. The two hormones decrease causing menopausal symptoms, such as hot flashes (feeling of heat from the chest to the face), the face and neck become sweaty, night sweats are cold sweat and at night, and urinary incontinence, namely the difficulty of holding urine long enough to get to the bathroom, resulting in intravascular volume deficiency due to lack of external fluids or redistribution of internal and extracellular fluids. This disrupts the balance of fluid in the blood vessels with fluid in the intestinal cavity which results in decreased albumin levels in menopausal women[4].

Albumin (69 kDa) is the main protein in human plasma (3.4-4.7 g / dL), and makes up about 60% of the total plasma protein. About 40% of albumin is present in plasma, and the remaining 60% is in the extracellular space (Murray et al, 2009). Albumin plays a role in helping to maintain blood colloid osmotic pressure (75-80% plasma osmotic pressure), as a transport protein of several kinds of substances including metals, bilirubin, enzymes, hormones, drugs [13]. The impact that occurs with a decrease in albumin is accumulation of fluid in the tissue or accumulation of fluid in the body cavity, namely swelling or edema. The

## Description Of Serum Albumin Levels In Menopause Women In The Working Area Of Puskesmas Kota Selatan

lack of albumin causes blood osmotic pressure to fall so that the transport of fatty acids, hormones, enzymes and drugs is disrupted which can reduce metabolism in the body[25].

Low serum albumin levels are important predictors of morbidity and mortality. For every 10 g / L decrease in serum albumin, the mortality rate increased by 137% and morbidity increased by 89%. In Indonesia, hospital malnutrition data shows that 40 - 50% of patients have hypoalbuminemia or are at risk of hypoalbuminemia, 12% of them are severe hypoalbuminemia, and the hospitalization period of patients with hospital malnutrition shows 90% longer than patients with good nutrition. Hypoalbuminemia is said if the blood albumin level is less than 3.5 g / dL[12].

Hypoalbuminemia has long been recognized as a marker of the risk of complications from hospitalization, with longer treatment, increased number of cases re-hospitalized, and higher mortality at day 90 and 1 year after discharge, among patients aged continued who was treated. Recently, hypoalbuminemia has been recognized as an important predictor of mortality at years 3, 5, and 9-10 in old age. Harimurti conducted a cross-sectional study of treated elderly patients with pneumonia, found 16 out of a total of 26 patients (61%) had hypoalbuminemia on admission. Further, little is known about the epidemiology of hypoalbuminemia in the elderly and the risk factors for this indicator for poor health status [12].

Blackburn's group reported the prognostic value of serum albumin in hospitalized patients. They studied the prognostic value of various nutritional and immunological parameters in 282 hospitalized patients, finding that hypoalbuminemia was the best predictor of mortality during treatment. Herrmann et al. Assessed serum albumin concentrations within 48 hours of

treatment, in 15,511 surgical and nonsurgical patients, who were over 40 years of age. Patients with hypoalbuminemia have higher mortality, longer stay, and more frequent re-admission to hospitalization[12].

Although hypoalbuminemia is commonly known as a marker of protein energy malnutrition, hypoalbuminemia is also associated with infection, inflammation, post-surgical stress, trauma, liver and kidney disease. Cross-sectional studies of three communities at the Established Populations for Epidemiologic Studies of the Elderly (EPESE) identified seven factors that were independently associated with the risk of decreasing albumin levels <3.5 g / dL, i.e. old age, there were two or more limitations in life activities. daily, smoking > 20 cigarettes per day, living in a nursing home, diagnosed and undergoing treatment for cancer, and anemia [12].

The background above explains the symptoms that arise in menopausal women and will interfere with serum albumin levels, so the researchers are interested in conducting research on "Image of Serum Albumin Levels in Menopausal Women in the Work Area of the South City Health Center".

### RESEARCH METHODS

This research is an observational study with a descriptive quantitative approach because this study only describes serum albumin levels in menopausal women, is limited to the data obtained, and does not generalize without any treatment on the research subjects. The design in this study used a cross sectional design, namely taking data, measuring the data, processing the data in one measurement during the time of the study which aims to see the serum albumin levels in menopausal women at the time of the study.

The study population was all menopausal women aged 45-65 years in

the working area of Puskesmas Kota Selatan. The number of respondents in this study was 95 people based on calculations from the assumptions / formula of SLOVIN ;  $n = \frac{N}{1 + N \cdot e^2}$  by using the error tolerance limit value of 10% (0.1).

The sampling technique used in this study was Simple Random Sampling, where each element has the same opportunity to be used as a sample. The data collection technique was done by using a questionnaire and using a Biosystem BTS-350 spectrometer using the BCG (Bromo Cresol Green) method.

The data obtained from the measurement will be analyzed using univariate analysis with descriptive test by looking at the distribution frequency of each variable studied.

## RESEARCH RESULT

This study, entitled Image of Albumin Serum in Menopausal Women in the Work Area of the South City Health Center was conducted on October 5 - October 22, 2020. This study aims to see the level or concentration of albumin in the blood in women who are no longer menstruating or menopausal women. The samples obtained were menopausal women aged 45-65 years who were in the health center service area of Kota Selatan and were examined at the Mirah Clinical Laboratory.

The results of examining the serum albumin levels of menopausal women in this study were as follows:

**Table 1.** *Distribution of frequency of serum albumin levels*

Result categories	n	%
Hypoalbuminemia	18	18.9
Normal	69	72.6
Hyperalbuminemia	8	8,4
Total	95	100.0

Source: Primary data, (2020)

Based on table 4.1, the age category 45-55 years, there are 62 respondents with a percentage of 65.3%, while in the 56-65 year age category there are 33 respondents with a percentage of 34.7%. From the two age categories above, it has an average value of 54.73 which is obtained from statistical calculations.

The results of respondents' serum albumin levels based on age are divided into two groups, can be seen in the following table:

**Table 2.** *Distribution of frequency of albumin levels by age*

Age	Result						Total	
	Hypoalbuminemia		Normal		Hyperalbuminemia		n	%
	n	%	n	%	n	%		
45-55	11	61.1	46	66.7	5	62.5	62	65.3
56-65	7	38.9	23	33.3	3	37.5	33	34.7

Source: Primary data, (2020)

Based on table 4.2, it shows that low serum albumin levels or hypoalbuminemia based on age are more in the 45-55 years age category, namely as much as 61.1% compared to the 56-65 year age category of 38.9%.

The frequency distribution of respondents' serum albumin levels based on symptoms of incontinence is divided into two groups, as follows:

**Table 3.** *Frequency distribution of respondent characteristics based on symptoms of incontinence*

Incontinence Symptoms	Result						Total	
	Hypoalbuminemia		Normal		Hyperalbuminemia		n	%
	n	%	n	%	n	%		
There is	17	94.4	16	23.2	2	25	35	36.8
Not	1	5,6	53	76.8	3	75	60	63.2

Source: Primary data, (2020)

Based on table 4.3, it shows that low serum albumin levels or hypoalbuminemia based on incontinence symptoms are more in the group with incontinence symptoms, namely 94.4% compared to the

## Description Of Serum Albumin Levels In Menopause Women In The Working Area Of Puskesmas Kota Selatan

group without incontentence symptoms as much as 5.6%.

The frequency distribution of the serum albumin levels of respondents based on a history of hepatic cirrhosis is divided into two groups, as follows:

**Table 4.** *The frequency distribution of albumin examination results was based on the respondents who had a history of cirrhosis of the liver*

History of having a disease	Result						Total	
	Hypoalbuminemia		Normal		Hyperalbuminemia		n	%
There is	n	%	n	%	n	%	n	%
There is	0	0	0	0	0	0	0	0
Not	18	100	69	100	8	100	95	100

Source: Primary Data, (2020)

Based on table 4.4 of the 95 samples available, it was not found that menopausal women had a history of hepatic cirrhosis.

### DISCUSSION

Serum albumin levels are important prognostic indicators because there is a correlation between low serum albumin levels and an increased risk of morbidity and mortality. Various conditions such as burns, liver disease, malabsorption syndrome, and malnutrition are often associated with low albumin levels, whereas conditions associated with high serum albumin levels are a high protein diet and dehydration [20].

This study has a total of 95 respondents with mixed results. The research respondents were menopausal women aged 45-65 years. The abnormal results of 26 people with hypoalbuminemia as much as 18.9% and hyperalbuminemia as much as 8.4%. Meanwhile, 72.6% of the other people had normal serum albumin levels with a reference value based on the tools used in measuring the values 3.5-5.7 mg / dl.

Apart from hypoalbuminemia, there were also samples that had elevated serum

albumin or hyperalbuminemia. Hyperalbuminemia can be associated with dehydration in the body [8]. In this study there was also a high serum albumin level or hyperalbuminemia as much as 8.4%. An increase in serum albumin is called hyperabuminemia. Hyperalbuminemia can be caused by several conditions, such as a high-protein diet, dehydration, and prolonged tourniquet binding when taking blood samples (Pongsibidang et al, 2016). In this study, it is assumed that the hyperalbuminemia experienced by the 8 samples is due to the consumption of a high protein diet. Dehydration is considered an unhealthy criterion. Meanwhile, prolonged tourniquet binding has been minimized at the time of taking blood samples so that it is unlikely that the condition will cause hyperalbuminemia in respondents. Currently, the consumption of a high protein diet, above the recommended nutritional adequacy rate for protein (RDA: 0.8 protein / kg / day), is increasing in popularity, but there is not much data on the side effects of a high protein diet[18]. Research on the effects of a high-protein diet was carried out by Mutlu et al. In 2006. This experimental study was conducted on two patients who were given high protein supplements and asked to exercise for physical fitness. The results after exercise, both samples experienced hyperalbuminemia, intermittent abdominal pain, transient increase in transaminases without any identifiable cause. Symptoms and abnormalities in laboratory tests can be resolved after stopping high protein intake. These findings raise concerns about the safety of a high protein diet combined with high-intensity exercise, while the pathogenesis and importance of this disorder are not yet known and require further research [18].

Results of serum albumin levels based on age

Menopause is the natural cessation of menstruation which usually occurs at the age of 45-50 years or the period of complete cessation of menstruation for 12 consecutive months. Endocrine changes - a hormone that is involved for many years in a woman's life are mainly due to increased loss of ovarian function [23].

Women of childbearing age and menopausal women have the hormones estrogen and progesterone, but these hormones decrease in menopausal women so that the blood circulation of these hormones is also reduced. albumin which carries the hormone also decreases because the binding between the hormone and albumin protein is reduced so that albumin production is reduced[4].

Based on the data obtained, the results of low serum albumin levels or hypoalbuminemia based on age were more in menopausal women aged 45-55 years compared to low serum albumin levels in menopausal women aged 56-65 years.

This study is supported by research by Anna et al. In 63 samples ranging in age from 21-43 years and 63-79 years. This study also shows a person's age does not affect serum albumin levels in the blood. [26]. However, this is different from the cohort study conducted by Motoko et al for 7 years with 36,674 samples in Japan. The results of the study showed that albumin levels decreased with age. This study supports Ikuko et al's 5-year longitudinal study of 62,854 samples in Japan. This study shows that age has a significant effect on serum albumin levels. Data from both studies indicate that serum albumin levels decrease with age, especially in the elderly[16]. Likewise with a study conducted by Gomi I et al for 5 years (1999-2003) entitled "Relationship between serum albumin level and aging in community dwelling self-supported elderly population", emphasizing that the rate of reduction in serum albumin

concentration was different according to gender and age, especially in women. The rate of decline is almost consistent at around 2% for men aged 65-89 years. On the contrary, this figure increases with aging in women.

Results of serum albumin levels based on symptoms of incontinence

Before menopause, estradiol and estrone were the main circulating estrogens in the body. These two hormones are produced mainly in the ovaries, with estradiol as the main hormone. Estrone is also produced through a change in one hormone, namely androstenedione, which is secreted by the adrenal glands. After menopause, the levels of estrone to estradiol drop drastically and estrone becomes the dominant estrogen. The two hormones decrease causing menopausal symptoms, such as hot flashes (feeling of heat from the chest to the face), the face and neck become sweaty, night sweats, cold sweats and at night, and urinary incontinence, namely the difficulty of holding urine long enough to get to the bathroom, resulting in intravascular volume deficiency due to lack of external fluids or redistribution of internal and extracellular fluids. This disrupts the balance of fluid in the blood vessels with fluid in the intestinal cavity resulting in decreased albumin levels in postmenopausal women, although the magnitude of the decrease varies widely between studies.

In addition, low serum albumin levels were higher in women who had symptoms of incontinence, namely 94.4% compared to women who did not have symptoms of incontinence, which was 5.6%.

The findings of this study are similar to research conducted by Dewi in 2017 by describing serum albumin levels in fertile women and menopausal women, it's just not in line. The results of serum albumin levels obtained from fertile women showed that most of the samples had

## Description Of Serum Albumin Levels In Menopause Women In The Working Area Of Puskesmas Kota Selatan

normal albumin levels with a percentage of 80%. Meanwhile, postmenopausal women showed slightly lower serum albumin levels with a percentage of 70%. This is due to the fact that most of the samples in this study have not fully disturbed the function of the hormones estrogen and progesterone so that they have not caused incontinence symptoms (difficulty in collecting urine).

### CONCLUSION

Describe the levels of serum albumin in menopausal women in the work area of Puskesmas Kota Selatan, namely normal albumin levels of 72.6% (69 respondents), low albumin levels of 18.9% (18 respondents), and high serum albumin levels of 8.4% (8 respondents). ).

Of the 18 respondents who had low albumin levels, most had symptoms of incontinence (17 respondents had symptoms and 1 respondent had no symptoms).

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